

TECHNICAL MEMORANDUM

E Crestview Drive Improvement Project

City Limits to N Springbrook Road

Traffic Summary

Date:	January 8, 2020	Project #:23726
To:	Brett Musick, PE, City of Newberg	
From:	Wade Scarbrough, PE	
cc:	Gregg Weston, PE, 3J Consulting	

This memorandum summarizes the projected traffic volumes and traffic-related information to support the E Crestview Drive Improvement Project. The subject portion of E Crestview Drive runs between the eastern City Limits and N Springbrook Road.

Existing Conditions

This segment of E Crestview Drive is currently under Yamhill County jurisdiction but will be transferred to the City of Newberg at the conclusion of the project. The roadway is classified as a major collector street in the City's Transportation System Plan (TSP, Reference 1). The eastern segment of this roadway is paved, while the western portion of the project area is unpaved (gravel). The existing roadway width varies. Curb and sidewalks exist on the eastern portion along the south side of the roadway for approximately 1,100 feet. No sidewalk exists on the north side and no striped bicycle lanes or other bicycle facilities exist on either side.

E Crestview Drive currently serves as a connector between N Springbrook Road and several local streets serving residential neighborhoods. The road ends approximately ½ mile east of N Springbrook Road with no connection to other collector or arterial streets. The roadway currently carries less than 1,000 vehicles per day. The current posted speed is 25 mph

Planned Improvements

This project will widen the existing roadway to the City's standard major collector street cross section, including one travel lane in each direction with bicycle lanes, sidewalks, and planter strips on each side. The total length of roadway to be improved, and ultimately transferred to City of Newberg jurisdiction, is approximately 2,000-feet. In addition to street improvements, the project will construct utility improvements, street lighting, and stormwater improvements meeting the City of Newberg Public Works Design and Construction Standards.

When completed, the improved roadway will connect N Springbrook Road with E Crestview Drive (outside of the City). A separate project by private development will extend from E Crestview Drive connecting to Highway 99W (E Portland Road) at N Providence Drive.

The anticipated speed limit for the roadway is 25 MPH.

Estimated Traffic Volumes

Kittelsohn & Associates, Inc. (Kittelsohn) estimated future traffic volumes on the project roadway based on the traffic projections from *Crestview Crossing Transportation Impact Analysis* (TIA, Reference 2). This traffic impact analysis (TIA) reviewed travel projections from the City's TSP as well as the regional travel demand model to estimate the amount of traffic expected to shift from other roads (primarily N Springbrook Road) onto E Crestview Drive following the project improvements as well as the extension to Highway 99W. The Crestview Crossing TIA then also overlaid the additional traffic that would be generated by the Crestview Crossing development as well as other in-process approved developments in the area. Additionally, the TIA applied a two-percent annual growth rate to estimate future traffic conditions in the year 2025.

As a conservative estimate of future conditions on E Crestview Drive, Kittelsohn applied the same two-percent annual growth rate onto the 2025 traffic projections to estimate traffic levels in year 2040 (representing a 20-year design horizon). Table 1 summarizes the estimated traffic volumes within the project limits of E Crestview Drive in 2025 and 2040.

Table 1: Estimated 2025 and 2040 Traffic Volumes

Estimated 2025 Traffic Volumes		
Weekday A.M. Peak Hour	Westbound	140 veh/hour
	Eastbound	250 veh/hour
	Total (both directions)	390 veh/hour
Weekday P.M. Peak Hour	Westbound	200 veh/hour
	Eastbound	250 veh/hour
	Total (both directions)	450 veh/hour
Average Daily Traffic Volume	Total (both directions)	4,500 veh/day
Estimated 2040 Traffic Volumes		
Weekday A.M. Peak Hour	Westbound	180 veh/hour
	Eastbound	325 veh/hour
	Total (both directions)	505 veh/hour
Weekday P.M. Peak Hour	Westbound	260 veh/hour
	Eastbound	325 veh/hour
	Total (both directions)	585 veh/hour
Average Daily Traffic Volume	Total (both directions)	5,850 veh/day

As shown in Table 1, the average daily traffic (ADT) on E Crestview Drive is expected to be approximately 4,500 vehicles per day in 2025 and may grow to 5,850 vehicles per day by 2040. These projected traffic volumes are within a typical range for an urban collector facility. All intersections along the project corridor are expected to operate within the City's performance standards. The proposed addition of sidewalks and bike lanes will provide appropriate facilities for non-motorized users.

E Crestview Drive/Westlake Loop Mini-Roundabout Concept

As part of the roadway improvement project, the City is considering installing a mini-roundabout at the intersection of E Crestview Drive and Westlake Loop. This existing intersection is currently operated as a two-way stop-controlled intersection, with a stop sign on the northbound (Westlake Loop) approach. The project will construct a new north leg of the intersection (opposite Westlake Loop) to provide access for future development to the north.

A mini-roundabout is a type of roundabout characterized by a small diameter and traversable center island. Mini-roundabouts offer most of the benefits of regular roundabouts with the added benefit of a smaller footprint. They are best suited in lower speed environments in which all roadways have posted speed of 30 mph or less (Reference 3). Benefits of the mini-roundabout concept as well as user considerations are discussed in the remainder of this memorandum.

Mini-Roundabout Benefits and Trade-Offs

At the E Crestview Drive/Westlake Loop intersection, the mini-roundabout offers a number of advantages over the existing two-way stop controlled intersection, including the following.

- **Speed Management** – Designed with geometry that forces traffic to enter and circulate at slower speeds, the mini-roundabout can help manage speeds along the corridor. The low-speed environment also enhances the intersection for non-motorized users.
- **Corridor Consistency** – Located between the existing full-size roundabout to the west (at N Springbrook Road) and two existing compact roundabouts to the east, the mini-roundabout will provide a consistent form of traffic control and will help maintain low and consistent speeds along the corridor.
- **Operational Efficiency** – the mini-roundabout may provide less delay for the critical movements on the side street approaches. As such, it is expected to provide ample capacity for the existing neighborhood on Westlake Loop as well as the future development to the north.
- **Compact Size** – the mini-roundabout can be constructed with minor impact to the existing right-of-way.
- **Residential Benefits** – The mini-roundabout offers a low-speed, low-noise intersection treatment that requires little ongoing maintenance.

Trade-offs of the mini-roundabout include the following:

- Slightly higher delay for through traffic on E Crestview Drive.
- Higher construction cost due to the need to reconstruct portions of the existing roadway and sidewalk.

Because of the City's desire to maintain low and consistent speeds along this corridor, the benefits of the mini-roundabout may outweigh the trade-offs.

User Considerations

The mini-roundabout can be designed to accommodate a variety of travel modes and user types. Considerations for four user groups – motorists, pedestrians, bicyclists, and emergency vehicles – are discussed below.

- **Motorists** – As with other types of roundabouts, mini-roundabouts can enhance the safety for drivers by:
 - Allowing more time to make decisions, act, and react;
 - Reducing the number of directions in which a driver needs to watch for conflicting traffic; and
 - Reducing the need to judge gaps in fast traffic.
- **Pedestrians** are accommodated at the crosswalks, which are located around the perimeter and set back approximately 20-25 feet from the yield line.
- **Bicyclists** will be accommodated by merging into the traffic lane prior to the roundabout and negotiating the roundabout like a motor vehicle. Bicyclists that are not comfortable riding with traffic may use the sidewalk ramps to access the sidewalk and crosswalks.
- **Emergency Vehicles** – because of the traversable central island and splitter islands, emergency vehicles should not have difficulty negotiating the mini-roundabout.

Design Considerations

Mini-roundabout design applies many of the same principles as the design of larger roundabouts, including speed reduction, design vehicle accommodation, and sight distance considerations. The design of the E Crestview Drive/Westlake Loop mini-roundabout has been described and documented in a separate memorandum (please see Reference 4).

References

1. City of Newberg, Oregon. *Transportation System Plan*. 2016
2. Kittelson & Associates, Inc. *Crestview Crossing Transportation Impact Analysis*. August 2018.
3. Rodegerdts, L. A., W. E. Scarbrough, and J. A. Bansen. *Technical Summary on Mini-Roundabouts*. FHWA, Washington, D.C., 2010.
4. 3J Consulting. *Westlake Loop Mini-Roundabout Technical Memorandum*. September 2019 (Draft).